

USPTO Customer No: 25280

Case 5093

**AMENDMENT**

1. (Currently amended) A process for making a dust control mat, said process comprising the steps of:
  - (a) positioning a textile component over a continuous layer of unvulcanized rubber;
  - (b) subjecting said textile component and said unvulcanized rubber layer to a series of temperature and pressure zones within a vulcanization chamber to create a mat composite, in which
    - a first zone has a first temperature and a first pressure,
    - a second zone has ~~the first~~ a non-uniform second temperature and a ~~second pressure~~, and
    - a third zone has a ~~second~~ uniform third temperature and ~~the a second~~ pressure,wherein the first temperature is less than that of the ~~second~~ third temperature and the ~~second~~ third temperature is that associated with vulcanization, and wherein ~~the first pressure is substantially that of atmospheric conditions and the second pressure is that associated with vulcanization~~ the second temperature is between the temperature of the first zone and the temperature of the third zone; and
  - (c) cutting said mat composite to produce individual dust control mats.
2. (Original) The process of Claim 1 wherein said textile component comprises a continuous roll of textile material.

USPTO Customer No. 25280

Case 5093

3. (Original) The process of Claim 1 wherein said textile component is comprised of fibers selected from the group consisting of nylon, polyester, cotton, and polypropylene.
4. (Original) The process of Claim 3 wherein said textile component is comprised of nylon.
5. (Original) The process of Claim 1 wherein said rubber layer is comprised of a rubber selected from the group consisting of acrylonitrile-butadiene rubber (NBR), styrene-butadiene rubber (SBR), carboxylated NBR, carboxylated SBR, ethylene-propylene-diene monomer rubber (EPDM), and blends thereof.
6. (Original) The process of Claim 1 wherein said rubber layer is comprised of acrylonitrile-butadiene rubber.
7. (Original) The process of Claim 1 wherein said rubber layer is comprised of multiple layers of rubber.
8. (Original) The process of Claim 7 wherein said rubber layer includes at least one layer of foam rubber.
9. (Original) The process of Claim 1 wherein said rubber layer has a thickness in the range of about 15 mils to about 200 mils.
10. (Original) The process of Claim 9 wherein said rubber layer has a thickness of about 60 mils.

USPTO Customer No. 25280

Case 5093

11. (Original) The process of Claim 1 wherein the first temperature is about 90 °F.
12. (Currently amended) The process of Claim 1 wherein the ~~second~~ third temperature is in the range of about 280 °F to about 400 °F and ~~wherein the second pressure is in the range of about 15 p.s.i. to about 50 p.s.i.~~
13. (Currently amended) The process of Claim 12 wherein the ~~second~~ third temperature is about 360 °F and ~~wherein the second pressure is about 40 p.s.i.~~
14. (Original) The process of Claim 1 wherein, after vulcanization in step (b), said mat composite is carried over a roll having spikes attached thereto which perforate said rubber layer and create micro-valves on the surface of said rubber layer.
15. (Withdrawn) A dust control mat composite having a continuous textile upper surface that is vulcanized to a continuous rubber lower surface, said textile surface and said rubber surface having approximately the same dimensions, such that said textile surface substantially covers said rubber surface.
16. (Withdrawn) The mat composite of Claim 15 wherein said textile upper surface is comprised of fibers selected from the group consisting of nylon, cotton, polyester, and polypropylene.

USPTO Customer No. 25280

Case 5093

17. (Withdrawn) The mat composite of Claim 16 wherein said textile upper surface is comprised of nylon.
18. (Withdrawn) The mat composite of Claim 15 wherein said rubber surface is comprised of a rubber selected from the group consisting of acrylonitrile-butadiene rubber (NBR), styrene-butadiene rubber (SBR), carboxylated NBR, carboxylated SBR, ethylene-propylene-diene monomer rubber (EPDM), and blends thereof.
19. (Withdrawn) The mat composite of Claim 18 wherein said rubber surface is comprised of acrylonitrile-butadiene rubber (NBR).
20. (Withdrawn) The mat composite of Claim 15 wherein said rubber surface is comprised of multiple layers of rubber.
21. (Withdrawn) The mat composite of Claim 20 wherein said rubber surface includes at least one foam rubber layer.
22. (Withdrawn) A dust control mat composite having a plurality of textile upper surfaces that are vulcanized to a continuous rubber lower surface, said textile upper surfaces comprising panels of a textile material that are positioned in spaced relation over said rubber lower surface.
23. (Withdrawn) The mat composite of Claim 22 wherein said textile material is comprised of fibers selected from the group consisting of nylon, cotton, polyester, and polypropylene.

USPTO Customer No. 25280

Case 5093

24. (Withdrawn) The mat composite of Claim 23 wherein said textile upper surface is comprised of nylon.
25. (Withdrawn) The mat composite of Claim 22 wherein said rubber surface is comprised of a rubber selected from the group consisting of acrylonitrile-butadiene rubber (NBR), styrene-butadiene rubber (SBR), carboxylated NBR, carboxylated SBR, ethylene-propylene-diene monomer rubber (EPDM), and blends thereof.
26. (Withdrawn) The mat composite of Claim 25 wherein said rubber surface is comprised of acrylonitrile-butadiene rubber (NBR).
27. (Withdrawn) The mat composite of Claim 22 wherein said rubber surface is comprised of multiple layers of rubber.
28. (Withdrawn) The mat composite of Claim 27 wherein said rubber surface includes at least one foam rubber layer.
29. (Withdrawn) The product of the process of Claim 1.
30. (Withdrawn) The product of the process of Claim 2.

USPTO Customer No. 25280

Case 5093

**RESPONSE****Restriction / Election Confirmation**

Restriction to one of the following inventions is required under 35 USC 121:

- I. Claims 1 – 14, drawn to a process of making a dust control mat; and
- II. Claims 15 – 30, drawn to a dust control mat.

By this response, Applicants hereby confirm the provisional election to Group 1, made by Applicants' agent during a telephone conversation on August 14, 2003.

**Rejection under 35 USC 112**

Claims 1 – 14 are rejected under 35 USC 112, first paragraph, for failing to comply with the written description requirement. Claims 1 and 12-13 have been amended to clarify the intended scope thereof. Applicants now submit that this rejection has been overcome and request that the Examiner withdraw the rejection.

**Rejection of Claims 1, 2, 9, and 10 under 35 USC 103(a)**

Claims 1, 2, 9, and 10 are rejected under 35 USC 103(a) as being unpatentable over the admitted prior art (FIG. 1 and Page 1, lines 22-25; Page 2, lines 1-2; and Page 3, lines 1-20) in view of either one of Kita et al. (JP 07060758 and the English abstract) or Ogawa (JP 57053338 and the English abstract).

The prior art described by Applicants includes an entry area with a first temperature and a first pressure that is less than that of the second (vulcanization) pressure. The first temperature is approximately that of the vulcanization temperature. Therefore, the prior art discloses a first zone with a first temperature and a first pressure and a second zone with the first temperature and a second pressure.

USPTO Customer No. 25280

Case 5093

During vulcanization of continuous sheets of rubber (as used by Applicants to produce a continuous mat composite), the conveyor apparatus must stop periodically to allow the vulcanization process to occur. When this happens, a certain portion of the rubber sheet is located at the entry zone of the vulcanization chamber. If the temperature in the entry zone of the chamber is not significantly lower than that of the remaining portion of the chamber, the rubber in the entry area begins to pre-cure when the conveyor stopped. Pre-curing of the rubber before vulcanization results in inadequate adhesion between the rubber and the textile component, resulting in a flawed mat product. For this reason, Applicants provide for a "cool zone" in the entry area of the vulcanization chamber, in which the temperature is significantly less than that necessary for vulcanization to occur.

Manufacturers using a batch process are less likely to experience this pre-curing problem. In a batch process, manufacturers are more able to control the placement of multiple separate panels of rubber (and corresponding textile components) within the vulcanization chamber in order to provide for appropriate vulcanization conditions for each of the composites. Accordingly, substituting a continuous rubber sheet for multiple separate panels of rubber cannot be practically accomplished without the introduction of a "cool zone" as provided by Applicants.

Neither the prior art as described by Applicants nor the Kita et al. reference nor the Ogawa reference disclose the use of multiple zones of various temperature—and specifically, the use of a "cool zone" of a first temperature, which is significantly less than vulcanization temperature—as claimed by Applicants. Because the references fail to teach all of the limitations of Applicants' claims, Applicants submit that the rejection is improper and should be withdrawn.

USPTO Customer No. 25280

Case 5093

Rejection of Claims 3 – 6 and 11 – 13 under 35 USC 103(a)

Claims 3 – 6 and 11 – 13 are rejected under 35 USC 103(a) as being unpatentable over the admitted prior art and either one of Kita et al. or Ogawa as applied above, and further in view of Kerr et al. (US Patent 5,902,662).

The Examiner suggests that "it would have been obvious for one of ordinary skill in that art at the time the invention was made to experimentally determine the exact temperatures and pressures in each zone as a function of the type of materials used, length of conveyor, vulcanization time, etc. as doing so would have required nothing more than ordinary skill and routine experimentation."

The shortcomings of the combination of the admitted prior art and either one of Kita et al. or Ogawa have been discussed above. As noted by Applicants, previous efforts to create vulcanized rubber mats with a textile upper surface did not include multiple zones of different temperatures and a "cool zone" with a temperature significantly less than the (third) vulcanization temperature. The Kerr patent does not overcome the shortcomings of the previously mentioned references, in that the combination of Kerr with the previous references fails to teach a number of zones within the vulcanization chamber and the use of continuous sheets of unvulcanized rubber. For this reason, Applicants believe the rejection should be withdrawn.

Rejection of Claim 7 under 35 USC 103(a)

Claim 7 is rejected under 35 USC 103(a) as being unpatentable over the admitted prior art and either one of Kita et al. or Ogawa as applied above, and further in view of Burke et al. (US Patent 5,834,086).



USPTO Customer No. 25280

Case 5093

The shortcomings of the combination of the admitted prior art with either Kita et al. or Ogawa have been discussed above. The Examiner states that "Burke et al. disclose a process for making a composite mat wherein the mat comprises a textile component, a rubber backing, and additional rubber layers on the edges of the backing." Burke et al. fails to disclose multiple layers of rubber used to cover the entire backing surface of the textile component. All of the references fail to teach the use of a continuous sheet of rubber to create a plurality of floor mats. For these reasons, Applicants believe the rejection should be withdrawn.

Rejection of Claim 8 under 35 USC 103(a)

Claim 8 is rejected under 35 USC 103(a) as being unpatentable over the admitted prior art and either one of Kita et al. or Ogawa and Burke et al. as applied above, and further in view of Kerr (US Patent 5,902,662).

The shortcomings of the combination of the admitted prior art with either Kita et al. or Ogawa have been discussed above. The further combination with Burke et al. as applied above has also been addressed. Applicants contend that incorporating a foam rubber layer in the present process is not obvious, because it is not clear from the Kerr patent that a continuous sheet including foam rubber would perform equally well in the claimed process. Foam rubber expands differently than dense rubber, because during vulcanization air pockets form in the foam rubber.

Because the combination of references fails to teach all of the limitations of Applicants' claims, Applicants believe that the rejection should be withdrawn.

USPTO Customer No. 25280

Case 5093

Rejection of Claim 14 under 35 USC 103(a)

Claim 14 is rejected under 35 USC 103(a) as being unpatentable over the admitted prior art and either one of Kita et al. and Ogawa as applied above, and further in view of Nichols et al.

The shortcomings of the combination of the admitted prior art with either Kita et al. or Ogawa as applied above have been discussed previously. Nichols et al. fail to teach the formation of micro-valves in a mat composite as part of an in-line process for modifying a continuous textile / rubber composite. For those reasons, Applicants believe the rejection should be withdrawn.

Rejection of Claims 1 – 3, 9, and 10 under 35 USC 103(a)

Claims 1 – 3, 9, and 10 are rejected under 35 USC 103(a) as being unpatentable over Kerr et al. (US Patent 4,902,465) in view of either one of Kita et al. or Ogawa.

Kerr et al. do not teach the use of three different temperature zones within the vulcanization chamber and the use of continuous sheets of rubber. Neither Kita et al. nor Ogawa teach the use of an entry zone in the vulcanization chamber, in which the temperature is significantly lower than that of vulcanization. Because the combination of references fails to teach all of the limitations of Applicants' claims, Applicants believe the rejection should be withdrawn.

Rejection of Claim 4 – 6 and 11 – 13 under 35 USC 103(a)

Claims 4 – 6 and 11 – 13 are rejected under 35 USC 103(a) as being unpatentable over Kerr et al. (US Patent 4,902,465) and either one of Kita et al. or Ogawa as applied above, and further in view of Kerr (US Patent 5,902,662).

USPTO Customer No. 25280

Case 5093

Neither Kerr et al. nor Kerr teach the use of three different temperature zones within the vulcanization chamber and the use of continuous sheets of rubber. Neither Kita et al. nor Ogawa teach the use of multiple zones in the vulcanization chamber and, more specifically, the use of an entry zone in the vulcanization chamber, in which the temperature is significantly lower than that of vulcanization. Because the combination of references fails to teach all of the limitations of Applicants' claims, Applicants believe the rejection should be withdrawn.

Rejection of Claim 7 under 35 USC 103(a)

Claim 7 is rejected under 35 USC 103(a) as being unpatentable over Kerr et al. and either one of Kita et al. or Ogawa as applied above, and further in view of Burke et al. (US Patent 5,834,086).

The shortcomings of the combination of Kerr et al. with either one of Kita et al. or Ogawa have been discussed above. The addition of Burke et al. fails to overcome these shortcomings, in that the new combination of Kerr et al. with either one of Kita et al. or Ogawa in view of Burke et al. does not provide for multiple temperature zones within the vulcanization chamber and multiple layers of rubber across the entire backing surface of the mat. For these reasons, Applicants believe the combination fails to teach all of the limitations of the claims and, therefore, the rejection should be withdrawn.

Rejection of Claim 8 under 35 USC 103(a)

Claim 8 is rejected under 35 USC 103(a) as being unpatentable over Kerr et al. and either one of Kita et al. or Ogawa and Burke et al., and further in view of Kerr.

USPTO Customer No. 25280

Case 5093

The shortcomings of the combination of Kerr et al. with either one of Kita et al. or Ogawa and Burke et al. have been discussed above. The addition of Kerr fails to overcome these shortcomings, in that the new combination of Kerr et al. with either one of Kita et al. or Ogawa and Burke et al. in view of Kerr does not provide for multiple temperature zones within the vulcanization chamber and the inclusion of a foam rubber layer within the mat. As has been pointed out previously, the characteristics of foam rubber (that is, the tendency of foam rubber to expand due to the formation of air bubbles) make it unobvious that foam rubber would perform equally well as dense rubber when used as a continuous sheet.

For these reasons, Applicants believe the combination fails to teach all of the limitations of the claims and, therefore, the rejection should be withdrawn.

Rejection of Claim 14 under 35 USC 103(a)

Claim 14 is rejected under 35 USC 103(a) as being unpatentable over Kerr et al. and either one of Kita et al. or Ogawa as applied above, and further in view of Nichols et al.

The shortcomings of the combination of Kerr et al. with either one of Kita et al. or Ogawa have been discussed above. The addition of Nichols et al. fails to overcome these shortcomings, in that the new combination of Kerr et al. with either one of Kita et al. or Ogawa in view of Nichols et al. does not provide for multiple temperature zones within the vulcanization chamber and providing the rubber layer surface with micro-valves. For these reasons, Applicants believe the combination fails to teach all of the limitations of the claims and, therefore, the rejection should be withdrawn.